

ABSTRACT OF THE DISCLOSURE

A device for guiding a charged particle beam comprising a first superconducting nano-channel. In one embodiment, the device comprises a superconducting nano-channel consisting essentially of a superconducting material in the form of a tube having a proximal end, a distal end, and a bend disposed between said proximal end and said distal end. In another embodiment, the device is formed by a substrate, a first area of superconducting material coated on the substrate and having a first edge, a second area of superconducting material coated on the substrate and having a second edge, the first edge of the first area of superconducting material and the second edge of the second area of superconducting material are substantially parallel. In another embodiment, the device comprises a superconducting nano-channel formed by a plurality of nano-scale superconducting rods disposed around a central region.